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W. O. THOMPSON, President

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COLLEGE OF EDUCATION

George F. Arps, Dean

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General

Educational Research Bulletin

Children's Interests as a Basis of What to Teach in General Science

C. A. Pollock

Indianola School, Columbus

Teachers of general science are agreed that the success of the introductory work in science—in which they may consider themselves engaged—is very largely measurable by the interests aroused. Teachers of advanced science, with but few exceptions, in choosing from the product of such a beginning course prefer pupils full of enthusiasm to those possessing the principles but predisposed against continuing the subject. Our primary aim then should be to insure interest in science and to cultivate a desire for more of it.

With this objective in view the first problem presented is, What shall we teach? No science teacher has as yet cast aside all regard for modesty, by presuming to give a complete and direct answer to this question. To its solution, however, many have made contribution so that today we have many practical helps. While there is little unanimity of opinion regarding the course of study to be adopted, there has been one idea that has withstood all criticism of the sifting process which has gone on in magazines, at science teachers' conventions, and at conferences, namely, that the teaching of general science should have as its center the child's environment. The content of what we teach is to take root in the everyday life of the child. Obviously then we must determine the pupils' environment if we would know what content to teach.

Various means of deriving this material present themselves. One suggestion, which has seemed ideal though impractical, is to canvass the pupils' science environment by dividing it into those phases which touch his life. Such a division might be the environment of the home, of the school, of the street, or of the camp. Another method is to have the class participate in a "Science Hunt" game. The class is divided into groups and each group sent out on a previously mapped-out route. They search for every item of a scientific nature that can be found and bring back a long list of items.

The procedure which I have accepted as the most workable is that of securing from as many eighth-grade pupils as possible a statement of at least five carefully thought-out questions which they desire to have answered in their science study. In obtaining these data and presenting them here it is hoped that further suggestions may be offered toward the ultimate solution of the problem of, what to teach in general science. I have further hopes that this study may point toward a more adequate basis of selecting general science textbooks and of choosing a list of science readings that will supplement the text.

In pursuance of this aim the following form was placed in the hands of every eighth-grade child in the Columbus schools.

Boys and Girls: You have by this time advanced far enough in the study of science to realize that in many ways it helps you to understand the things which you never understood before. As a wide-awake boy or girl you have been wondering about the rain, wind, and sun; about things living and things mechanical. Always there is present in your mind a question and somewhere in this new subject of science there is an answer.

Science takes in a great many things; and because there are so many, our great scientists usually spend their time on one special thing in which they are interested. Some scientists have found out for us much about the sun, moon, and stars. Some have spent their time learning about plants and flowers; others about birds, insects, and other animals. Some have performed wonderful experiments with chemicals. Other men are working with electricity, finding out for us about radio, the telephone, the telegraph, the electric light, and the street car. Some spend most of their time studying the winds, the clouds, the ocean, mountains, rocks, and minerals. In this vast storehouse of information are to be found solutions for the things that puzzle you. Now in order that the teachers of general science may be most helpful to you they desire to know what boys and girls of your age find most interesting. To determine this you are each asked to make a list of no more than five things or questions in which you are really most interested. When you go home tonight spend some time thinking it over and then make your list at the numbers indicated below. Bring them back tomorrow to be collected and arranged in order.

Perhaps these examples will help you.

Tom: What makes an automobile go?
John: Are there people living on Mars?
Mary: What makes the gas stove go pop?
Ruth: How far away are the stars?
Gene: What makes the leaves turn yellow?
Bob: Why does the thunder make the windows rattle?

The questions submitted by one girl in VIII-B were: How far away is the sun? Why won't a stone float on water? How are geysers caused? What makes a camera take pictures? How is music carried from the voice into a record?

At the time these data were compiled, reports had been received from thirteen schools including pupils who sent in 3,500 questions. The questions were grouped under word headings as accurately as they would permit and were listed as to the boys and girls, VIII-A and VIII-B. The accompanying list of one hundred and nineteen words indicates the questions asked. Each is followed by a number in parentheses which is the index of its frequency of mention.

One need but glance at List 1 to be convinced of the wide and varied scope of interests which appear in early adolescence. Junior-high teach-

LIST 1. CHILDREN'S INTEREST LIST.

acid (13)
adhesion (2)
aeroplane (81)
air (82)
alcohol (2)
anatomy (27)
anesthetic (4)
animals (37)
asbestos (3)
automobile (18)

bacteria (38)
bees (4)
birds (12)
bluing (6)
building material (9)
buoyancy (4)

centrifugal force (2)
chalk (2)
charcoal (2)
chemistry (15)
climate (19)
clothing (6)
clouds (40)
coal (20)
color (10)
comet (3)
compass (6)
condensation (4)
conservation (3)
cyclones (8)

density (2)
digestion (4)
drugs (8)
dyeing (11)

earth (72)
earthquake (30)
eclipses (8)
electricity (349)
engine (24)
ether (6)
evaporation (22)
evolution (12)
explosion (6)

firearms (4)
fishing (23)
flowers (22)
fog (3)
food (25)
fruits (4)
gas (50)
geyser (3)
glacier (2)
glass (15)
gold (2)
grafting (2)
grass (8)
gravity (83)

hail (3)
heat (181)
heredity (6)
hibernation (2)

ice (10)
irrigation (2)

latitude (3)
light (57)
lightning (157)
life (4)

machinery (36)
Mars (97)
metals (9)
milky way (3)
minerals (15)
molecules (2)
moon (120)

Nature (27)
northern lights (3)
nitrogen (4)

oil (16)
oxygen (18)

paper (4)
perpetual motion (4)
phonograph (18)
photograph (21)
piano (10)
pigeons (2)
planets (146)
plants (97)
platinum (2)
potash (2)

radio (243)
radium (27)
rain (24)
rainbows (5)
rotation (46)
rubber (4)
sea (31)
seasons (21)
sight (4)
sky (17)
smoke (11)
snow (30)
soap (15)
sound (51)
stars (253)
steam (8)
stones (25)
sun (98)
submarine (15)

taxidermy (2)
teeth (2)
telephone (25)
tides (2)
trees (37)

volcanoes (38)
vitamines (2)

water supply (36)
weather forecast (9)
wind (86)

yeast (4)

ers have already accepted this fact as a challenge. It is our privilege to turn this interest into capital. This interest list may serve as the framework for the construction of the course of study. The frequency index may indicate the points of emphasis and problem centers. The alphabetical order has been followed in this interest list to emphasize the importance of getting away from the stratified grouping which in the past dictated that the organization used be that of the specialized sciences. Obviously to preserve and further stimulate interest the psychological order must direct the way. This study has not revealed any special interests in VIII-A not to be found in VIII-B. Figure 1 shows, however, that the interest span of the pupils in VIII-B exceeded that of the VIII-A's by 7.7 percent.

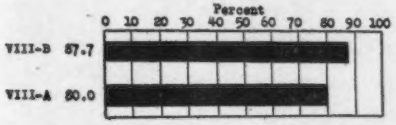
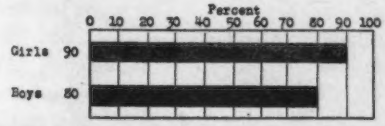


FIGURE 1. RELATIVE INTEREST SPAN OF THE PUPILS IN VIII-B AND VIII-A

No attempt will be offered in explanation for this falling off of interest in the latter part of our general science course, unless in jest, I may say that we have succeeded in killing interest or are developing specialists.

Another suggestive comparison was found in the relative interest span of boys and girls. The range of interest with the girls was found to exceed that of the boys by ten percent as Figure 2 indicates.



FIGURES 2. RELATIVE INTEREST SPAN OF BOYS AND GIRLS

In List 2 are given the topics in which the girls were interested exclusively.

LIST 2

bluing	fruits	hibernation
buoyancy	gold	milky way
clothing	grafting	nitrogen
condensation	hail	potash
comet	heredity	sight

The topics in List 3 are those in which boys expressed an interest to the exclusion of the girls.

LIST 3

alcohol	irrigation	mind
chalk	life	pigeons
centrifugal force	taxidermy	rubber
conservation	vitamines	storage battery

While many of the items in these lists will be recognized as characteristic of the interests of boys and girls, it is possible that other items came by accident into this classification. The point of greatest significance no doubt is the fact that boys' interests at this age diverge from those of the girls. Hence in the science course, as elsewhere, provision should be made, as far as practicable, for sex differences.

Our thoughts thus far have been concerned with the child's point of view. We have very properly considered first the things which he is interested in, works with, and talks about. The question might be asked, to what extent is the adult point of view to be a directive force in shaping our course of study? How about the items which we feel that the child should know for intelligent participation in society? In other words, of what weight should the textbook be considered as an index of what to teach? For after all, the textbook represents an adult's interpretation of the child's environment. To test the reality of this apparent conflict the Children's Interest List has been compared with the point of view in our general science text. Of the approximately 3,500 questions examined only 43 percent were answered or touched upon by the author.

Certainly there is a remarkably small amount of overlapping between the child's interests and his textbook. What an impetus it must be to turn with a question to the textbook with possibly but one chance out of three that it will be answered. Further emphasis is given to this by List 4 which enumerates topics upon which the text has not touched. The arrangement is in the order of the interest frequency which is indicated by the number in parentheses.

LIST 4

stars (253)	flowers (22)
radio (243)	sea (31)
lightning (157)	phonograph (18)
planets (146)	sky (17)
moon (120)	submarine (15)
Mars (97)	glass (15)
gravity (83)	minerals (15)
aeroplane (81)	soap (15)
sun (98)	evolution (12)
radium (27)	birds (12)
Nature (27)	cyclones (8)
fishing (23)	eclipses (8)

Further evidence is unnecessary to lead to the conclusion that the textbook should not dominate the teaching situation. However important the adult point of view as to the child's environment may be, it is inconceivable that the breach should be so great. It might be argued that the shortcomings of one particular text may be greater than those of another. This is no doubt true, yet we will all agree that, while authors differ in the subject matter stressed and in organization, in the main there is a striking similarity in content. In an examination made of fifteen textbooks by Morris Meister of Teachers College, Columbia University, it was found that the proportion of the Children's Interest List to be found in these present-day texts ranged from 21 percent to 64 percent.

In the light of these findings perhaps the wisest course to follow, if we are to remain true to our aim and teach the environment, is not to tie ourselves to any particular text in mapping our course in general science. Let the Children's Interest List direct the way. Have the text which contributes most to the interest of the pupils in the foreground and use for reference the others which have stressed and developed special environment. Supplement these with carefully selected readings and references.[2] Thus we can hope to be most nearly approaching the solution of our problem of what to teach in order to enable the child to interpret, appreciate, and master his environment.

Report of The State-Wide Testing Project In Information and Problem Geography

P. R. STEVENSON
Ohio State University

Over one hundred and fifty city and county superintendents have cooperated with the Bureau of Educational Research in measuring the attainment of Ohio pupils in United States geography. The test used was the Buckingham-Stevenson Geography Test, United States, Information and Problems[1]. During the month of October it was administered to more than 40,000 children.

The test is so arranged that a separate score may be obtained for each of the two divisions, namely, information and problems. Separate norms were computed for five different types of schools: (1) one-teacher schools, (2) consolidated schools, (3) villages up to 3,000 population, (4) cities from 3,000 to 10,000 population,

(1) Published by Public School Publishing Company, Bloomington, Illinois.

(2) A list of helpful books is given by Morris Meister in the February, 1922, issue of the *Monthly Guide to Science Teachers*.

and (5) cities having more than 10,000 population.

Table I presents detailed results for these types of schools. The 25-percentile indicates the score below which twenty-five percent of the pupils fell while the 75-percentile shows the score which was exceeded by twenty-five percent of the pupils.

An examination of Table I will show that pupils within a given grade varied greatly in their ability to answer the questions. As to rural schools in grade V, in the information test 25 percent of the pupils scored below seven, while 25 percent made scores at least twice as high, fourteen. In "problems" the 25-percentile was three, while the 75-percentile was seven. Similar variability in scores is indicated for the other grades. This applies not only to the one-teacher schools but also to all the schools.

Another interesting fact is that considerable overlapping of ability is shown from grade to grade. Again referring to Table I the reader will note that the pupils in the upper 75 percent of a given grade obtained a score which is equal to or above the median score of the next higher grade. For example, on information the 75-percentile for grade V is fourteen and the median for grade VI is fifteen; the 75-percentile for grade VI is nineteen and the median for grade VII is eighteen; and the 75-percentile for grade VII is twenty-three, while the eighth-grade median is twenty-one. This same tendency is also found in all types of schools, as will be seen upon examination of the subsequent parts of Table I.

In Part V of Table I norms are given for cities having semi-annual promotions. The B groups represent the classes which began the work in a given grade in September, while the A groups represent those which had completed one semester's work in the given grade by September. With very few exceptions the A groups made higher scores than did the corresponding B groups.

TABLE I. NORMS FOR THE BUCKINGHAM-STEVENSON GEOGRAPHY TESTS

I. NORMS FOR ONE-TEACHER SCHOOLS

GRADE	SCORE					
	Information			Problem		
	25-Percentile	Median	75-Percentile	25-Percentile	Median	75-Percentile
V	7	11	14	3	5	7
VI	10	15	19	5	7	10
VII	13	18	23	7	9	13
VIII	16	21	27	9	13	16

II. NORMS FOR RURAL-CONSOLIDATED SCHOOLS

GRADE	SCORE					
	Information			Problem		
	25-Percentile	Median	75-Percentile	25-Percentile	Median	75-Percentile
V	7	11	15	3	5	8
VI	11	16	21	5	8	11
VII	15	20	25	8	11	15
VIII	20	25	30	10	14	18

III. NORMS FOR VILLAGES UP TO THREE THOUSAND

GRADE	SCORE					
	Information			Problem		
	25-Percentile	Median	75-Percentile	25-Percentile	Median	75-Percentile
V	8	11	16	3	5	8
VI	12	19	25	5	8	11
VII	16	22	28	7	11	15
VIII	19	25	32	10	14	18

IV. NORMS FOR CITIES OF THREE THOUSAND TO TEN THOUSAND POPULATION

GRADE	SCORE					
	Information			Problem		
	25-Percentile	Median	75-Percentile	25-Percentile	Median	75-Percentile
V	10	14	19	4	6	10
VI	14	19	26	7	9	13
VII	17	23	28	9	11	15
VIII	23	28	33	12	15	19

V. NORMS FOR CITIES OF TEN THOUSAND OR MORE

GRADE	SCORE					
	Information			Problem		
	25–Per-centile	Me-dian	75–Per-centile	25–Per-centile	Me-dian	75–Per-centile
V-B	10	14	18	4	7	9
V-A	10	15	19	5	8	10
VI-B	12	17	22	6	9	12
VI-A	13	18	22	8	10	14
VII-B	17	22	28	9	12	16
VII-A	18	23	30	10	13	17
VIII-B	20	25	32	11	15	18
VIII-A	21	27	33	11	15	19

Table II summarizes the results of the testing. From this table it is evident that (1) the one-teacher schools and consolidated schools stand lowest, (2) the city schools are highest, (3) the village schools hold a median position. The last three columns are given to show the relative standing of the different types. While the cities having a population over 10,000 surpassed all others in Part II, the total ranking of the groups is as follows: First, cities 3,000 to 10,000 population; second, cities over 10,000 population; third, villages up to 3,000 population; fourth, consolidated schools; and fifth or last, one-teacher schools.

It is interesting to note in this connection that in the state-wide testing program in place geography[2] last year the schools ranked in the same order, namely, the smaller cities stood first; the larger cities, next; and the rural schools, last. From these results it would seem that pupils get the best geography instruction in smaller cities and the poorest instruction in one-teacher rural schools.

(2) Stevenson, P. R. "Report of the State-Wide Testing Project in Place Geography." *Educational Research Bulletin*, 2:118-19, April 8, 1923.

IMPROVING GEOGRAPHY INSTRUCTION

Since several superintendents have asked for assistance in following up the testing program, it may not be out of place at this time to offer some suggestions for improving geography instruction.

Importance of Geography—Interest in geography study has greatly increased since the World War. During the war, practically all American citizens were studying maps of Western Europe and following the fortunes of the Allied armies. For the first time our country became definitely concerned in world relations. Ordinary economic and social activities were greatly disturbed because of the war. Due to the lack of man power, many women entered industrial and commercial life. The fundamental dependence of our entire social structure upon other peoples was made very evident. Commodities which we had become accustomed to and regarded as necessities were gradually taken away from us. Our woolen clothing became only partly wool and colored with inferior dyes. We ate bread made of something besides wheat. Our understanding of the political power of our own government was extended to the drafting of soldiers, the commandeering of supplies, and the limiting of the output of the industrial world. It was even necessary to secure special permits from the proper authorities to build a house. Many large public buildings, including schools, could not be erected.

Early in the war the powers at Washington felt the need of advice from expert geographers. A large number of these men were called to Washington and spent their entire time advising the War Department in regard to problems of distribution of food, clothing, and raw materials, and of transportation.

In the period of reconstruction, a knowledge of geography is also important. The competition for the

world market, the need for raw products, and the distribution of manufactured goods present pressing economic and social problems. The establishment of new relations, the changing of old boundary lines, and the adjustments of different peoples to each other offer interesting material for instructional purposes.

What is Geography.—Without attempting to give a technical definition, we might say that geography is the general science of the elementary grades, and also the science of everyday life or human relationships. The application of its principles can be made from intimate and daily experiences of the individual. It includes interesting facts from biology, mathematics, geology, economics, physics, and other sciences. Hundreds of the questions asked by children may be satisfactorily answered through a study of geography. The average child asks countless questions concerning his environment, the majority of which are left unanswered. The following are illustrations of the child's interest in geographical phenomena: What makes snow? Where does the rain go? Why don't we have more houses in the country? What makes the wind blow? What are they going to do with all those cars of coal?

Aims.—The general objective of public education is the training of the individual to the highest degree of social efficiency of which he is capable. Geography teaching should follow the general aim. It should aid the pupil in adapting himself to his environment and in interpreting surrounding conditions with the view of improving them.

Outcomes.—To be still more definite, the teacher should also have in mind the outcomes or results which she hopes to attain. The course of study for Berkeley, California, has outlined these under three heads: (1) knowledge, (2) habits and skills, and (3) attitudes or ideals.

Under knowledge is included facts, geographic principles, and relationships. In grade III the following are suggested:

People live under different conditions of surface and climate; for this reason they solve the problems of securing food, clothing, and shelter in various ways.

People in different localities have different advantages which make exchange and cooperation necessary. They utilize materials at hand in supplying food, clothing, and shelter.

People of the world are doing many different kinds of work.

Little people of foreign lands love games, amusements, and stories as children of our country do.

TABLE II. COMPARISON OF MEDIAN SCORES OBTAINED IN THE DIFFERENT TYPES OF SCHOOLS

TYPE OF SCHOOL	GRADE								TOTAL SCORE		
	V.		VI		VII		VIII		Grades V, VI, VII, and VIII		Parts one and two combined
	Part		Part		Part		Part		Part		
	1	2	1	2	1	2	1	2	1	2	
One-teacher schools	11	5	15	7	18	9	21	13	65	34	99
Consolidated schools	11	5	16	8	20	11	25	14	72	38	110
Villages up to 3,000 population	11	5	19	8	22	11	25	14	77	37	115
Cities 3,000 to 10,000 population	14	6	19	9	23	11	28	15	84	41	125
Cities over 10,000 population	14	7	17	9	22	12	25	15	78	43	121

In the sixth grade the data expected are:

Knowledge of the contributions of Europe to our country; its citizens, history, literature, art, and products.

The relation of physical features to production and the great industrial areas of Europe; the effect of location, winds, and ocean currents upon climate; the relation of the coast line to commerce.

Comparison of Europe and North America, United States and Ohio in regard to size, location, latitude, longitude, and climate.

Political divisions of the new Europe; main arteries of transportation and commerce, internationalized rivers and ports, chief imports and exports of world powers.

The relation of relief, boundaries of nations, coast line, climate, winds, and natural resources to density and distribution of population and industries.

Growing ability to use and draw inferences from physical and political maps or from facts; growing ability to gather data for the solution of problems.

Remedial Instruction. — The only legitimate excuse for giving standardized tests is for the improvement of instruction. The tests help only in showing where the pupils stand in respect to their fellow pupils. Teachers should know the difficulties of each pupil and endeavor to give the kind of instruction which will do the most good. If the pupil is below standard in place geography, a reasonable amount of map drill should be given. If, on the other hand, the pupil lacks general geographical information or the ability to apply facts and principles to concrete situations, the teacher has a more difficult situation to face. The fault may not lie in the method of teaching but in the course of study and the amount of supplementary reading available.

A definite course of study suggesting the use of more than one textbook as well as supplementary reading is almost a pre-requisite for the teaching of modern geography. Particularly is this true if pupils are to be taught how to solve geography problems. The Detroit Course of Study is a good example of what can be done in arranging geography content around a series of interesting problem questions. Not only are lists of problem questions given but there is also a list of references from which the pupil is able to find the correct answer. For example, the question, "Why is Seattle of great commercial importance?" is asked and the following references are given which not only allow the pupil to solve the problem but also furnish a wealth of interesting information:

REFERENCES:

McMurry and Parkins, Advanced, pp. 151, 153, 157
Brigham and McFarlane, Second Book, p. 184
Dodge, Advanced, p. 174
Carpenter, United States, pp. 318-321
Smith, Book Two, pp. 115-117

A carpenter can build a rough shed with no tools except a hammer and a saw. In like manner a teacher can do a mediocre job of teaching geography with a single book; but if a real job is to be done, she must have many tools and know how to use them.

One important item in geography instruction which is generally neglected is the teaching of the new words which are necessary for the comprehension of the subject matter. The following quotation can probably be as easily understood by the average teacher as the beginning geography text by a fourth-grade pupil:

A multiple and partial correlation ratio method enables an estimation of the magnitudes of the multiple and partial correlations between graduated variables which are not related to each other by means of rectilinear regression lines.

Multiple and partial contingency method accomplishes the same result as multiple and partial correlation ratios, and is particularly applicable to data recorded in a categorical manner. This method also leads to interpretation in terms of probability.

Words such as *region*, *area*, *resources*, *emigrate*, and *export* occur frequently in the texts and are seldom explained.

There are also words which have a technical and specific meaning when applied to geography. Imagine what meaning a child will obtain from a paragraph containing the word "coast" if the only concept he has for the word is "to coast down hill;" or from a paragraph containing "product" if he associates with it the ideas which he has learned in arithmetic.

Special attention should be given to these difficult and technical words. Children should have practice in expressing the sentences of the text in their own words and be instructed to make lists of new words.

Publicity in Campaign for Bonds and Extra Levies

To Our Friends Outside of Ohio:

The Bureau has been assisting superintendents in their publicity campaigns for better schools. One hundred per cent of the cooperating cities were successful in their elections. The superintendents in these cities were sent scrapbooks in which to paste various types of publicity used, sheets containing an outline of their organization, etc.

We are now being asked to advise superintendents in other states who are expecting to engage in publicity campaigns. We are complying with these requests and shall continue to do so as long as it is a physical possibility. In return for our services we are asking these men to paste their campaign materials in scrapbooks, furnished by the Bureau, and return them at the close of their campaign.

Superintendents who have recently gone through a publicity campaign may assist materially both us and these school men by sending in a detailed report of their activities. Some of the important items which will be helpful are:

A. Organization:
   1. The campaign management
   2. Campaign committees
   3. Cost of campaign
   4. Source of money for campaign
   5. Purpose of campaign

B. Means for securing publicity:
   1. Speakers and meetings
   2. Examples of the following: Bulletins; posters; newspaper articles, cartoons; editorials, column advertising; circular letters and cards; instructions to voters; endorsements by local organizations and citizens; handbills; children's letters to parents; pupils' essays published in papers; description of school exhibits, demonstrations, and parades; description of slides or motion pictures used at motion picture houses; school papers and slogans.

C. Detailed description of services rendered by—
   1. School children
   2. Teachers
   3. Principals
   4. Superintendent
   5. Parent-Teacher Association
   6. Other organizations

A suggestion which appears in the *Speedometer* of Portage County regarding school exhibits is: "Not only is the public in general ignorant of what the schools are doing but one school does not know much about its neighbor's achievements. In order to give a little wholesome publicity to the program of classroom and shop and provide an opportunity for comparison, a county school exhibit is planned in conjunction with the annual track and field meet. Schools are asked to make entries along four different lines: writing, drawing, sewing, and manual training. Suitable prizes will be awarded to winners in these departments. Preliminary to this the committee suggests that each school make local exhibits from time to time throughout the year. Much individual work may be displayed so that every parent can have an opportunity to judge the attainment of his own child."

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A Study of Class-Size

A mooted question for some years in educational circles has been the desirable size of class. Practice seems to have accepted the principle of diminishing the number of pupils taught by the teacher as the grade is advanced. The report of the American City Bureau entitled *Know and Help Your Schools*, indicates that the prevailing size of class for the elementary school throughout the country is 38; for the junior high school, 28; and for the senior high school, 25.

Although there have been a number of investigations of the size of class within the last decade, they seem to have exerted little or no effect upon prevailing practice. The need of more conclusive information on this subject is evinced by the ineffectual influence of these earlier studies.

A study of the influence of class-size upon the pupil's attainment, which presents highly suggestive results, has recently appeared in the monograph series of the *Journal of Educational Research*. In this monograph, *Smaller Classes or Larger*, is summarized in detail a most careful and scientific investigation made by Dr. P. R. Stevenson.

Through the cooperation of the Chicago public schools and under the direction of the Bureau of Educational Research, University of Illinois, Dr. Stevenson was afforded an unusual opportunity to study this problem. Fifty classes in the elementary schools of Chicago, including grades II, V, and VII and 134 high-school classes, took part in the project.

The technique followed in this investigation is worthy of comment. The author includes within the preliminary delineation of his problem not only a review of former studies, but a summary of the size of classes prevailing in Chicago and in 180 other Illinois cities, together with a synopsis of expert opinions on the subject.

The method used in the elementary school was, of necessity, different from that used in the high school. The elementary classes were paired so that each teacher concerned taught the same group of pupils at one time as a small class and, at another time, with increased enrollment, in a large class.

To obviate the effect of certain factors which might favor the first semester rather than the second a scheme of rotation was used. By this method half the classes started as "large" in the first semester and were reduced to "small" in the second semester. The rest began as "small" in September, and their enrollment was increased so that they became large classes in February.

The results of the experiment are expressed in terms of pupils' gains in one semester over those in the other. Certain standardized tests were given at the opening of school, at the end of the first semester, and again at the end of the year. Each pupil's results were transmuted to T-scores and the gains or losses were expressed in T-units.

Unusual care was also employed with the high-school groups. Each teacher taught for a semester a pair of classes, one large and the other small. The large classes averaged about 38 pupils and the small classes about 20. All pupils were given intelligence tests and classes were paired, having about

the same average and variability of intelligence. Within the large class were included pupils who were paired with the members of the small class. The pupils of each pair had identical or nearly identical intelligence scores. By this method it was possible to compare the advances made by pupils of equal ability when taught by the same teacher in large and in small classes.

The author himself after modestly expressing his findings asserts that a more extensive investigation is needed to enable the investigator to speak with authority. Whether this be true or not, Dr. Stevenson here reports an investigation characterized by a scientific breadth of view and a most painstaking technique. School men interested in the problem of the size of class in relation to the efficiency of teaching will do well to read this monograph.

News of the Bureau of Educational Research

Project 40. Remedial Instruction in Arithmetic

PART A. INCREASING THE ABILITY TO SOLVE PROBLEMS

I. TESTS TO BE GIVEN

At the beginning of the experiment the following tests are to be given:

Buckingham Scale for Problems in Arithmetic, Form I. (Division 2 for grades V and VI, Division 3 for grades VII and VIII).

Stevenson Arithmetic Problem-Analysis Test, Form I.

II. ANALYSIS AND TABULATION OF TEST RESULTS

Use Record Sheet No. 1. Record the results of the Buckingham Scale in the column, *Problem Scale, First Trial.* Record the results of the analysis test for the individual parts—A, B, C, etc.,—under the columns headed *First Trial.* Also record the total score of the first trial.

III. REMEDIAL INSTRUCTION

The remedial instruction is planned to cover a period of twelve weeks. All the work is to be done in the recitation period. Three fifteen-minute periods each week are to be devoted to special remedial work. This makes a total of nine hours.

First, second, and third weeks.—During these three weeks the pupils should be taught to read and analyze problems. The pupils should be directed to open their books to a page containing a list of problems. Before solving a problem drill should be given in finding what facts are given in the problem, what is asked, the process or different processes which should be used in solving the problem, and the answer in round numbers (some of the problems should be worked to see if the estimated answers are approximately correct).

A list of problems should also be written on the board and pupils instructed to answer the above types of questions either orally or in writing. The teacher should study the results of the analysis test, and see that each pupil gets practice in the exercises upon which he failed. Pupils having the same difficulties may be given instruction in groups.

Fourth, fifth, and sixth weeks.—The pupils should work a large variety of problems during these three weeks. These problems should contain data from actual life situations.

The teacher should ask the pupils to submit lists of problems in addition, subtraction, multiplication, and division. These problems should be similar to those which the pupils and their parents have occasion to solve. Keep a selected list of these problems and send it to the Bureau.

The teacher should try to arouse pupils' interest in solving different types of problems.

Seventh, eighth, and ninth weeks.—During this time have pupils solve problems without the use of numbers. These problems will, of necessity, have to be made up by the teacher and should be adapted to each grade. The following examples will furnish suggestions:

1. If you knew the amount of cloth needed to make a dress, how could you find the amount necessary for three dresses?
2. If you knew the cost of one dozen oranges, how would you find the cost of six oranges?
3. If you knew the height of each pupil in your class, how could you find the average height?
4. If you knew the amount paid for a house and the rate of commission, how could you find the commission?
5. If you knew the present population of your town and the population five years ago, how could you find the amount of gain? The percent of gain?

Tenth, eleventh, and twelfth weeks.—During these weeks teach pupils to read problems and have them study their vocabulary. Devices which will be of assistance here are:

1. Have pupils state problems in their own words. Have each problem stated in as many different ways as possible.
2. In various problems study words which might cause difficulty. Have the children explain the meanings or define such words. Some words with which children have difficulty are: area, average, dealer, retail, commission, salary, rent, broker, wages, merchant, debt, expenses, acre, income, profit, loss, and insurance. A list of words for the different grades will be sent to teachers who cooperate. Whenever possible, concrete explanations should be made by the teacher or the pupils.

BUREAU OF EDUCATIONAL RESEARCH
OHIO STATE UNIVERSITY

PROJECT 40. PART A. INCREASING ABILITY TO SOLVE PROBLEMS

RECORD SHEET NO. 1

NAME	BUCKINGHAM PROBLEM SCALE			STEVENSON PROBLEM-ANALYSIS TEST																
				A			B			C			D			Total				
	Trial		Gain	Trial		Gain	Trial		Gain	Trial		Gain	Trial		Gain	Trial		Gain		
	1	2		1	2		1	2		1	2		1	2		1	2			
Total . . .																				
Average . .																				

IV. FINAL TESTING AND TABULATING

During the thirteenth week give (1) Buckingham Scale for Problems in Arithmetic, Form II (Division 2 for grades V and VI, Division 3 for grades VII and VIII), (2) Stevenson Arithmetic Problem-Analysis Test, Form II. Record the scores on Record Sheet No. 1 in the spaces indicated for the second trial. Compute and record the gains made on each test or part of a test in the spaces indicated, and find the average score on the first and second trials and also the average gain for the grades.

The effect of remedial instruction should be indicated by the largeness or smallness of the total gains.

V. OTHER WAYS OF USING THESE DATA

If intelligent scores are available for the pupils, we then shall be able to determine whether the bright, average, or dull pupils were favored most by the instruction. This is rather an important part of the experiment but, of course, involves the added labor and expense of giving and scoring the intelligence tests.

The Bureau will be very glad to cooperate with any teacher, supervisor, or superintendent who will participate in this project. This applies not only to school people of Ohio but to those in other states. Address communications to P. R. Stevenson.

The following Toledo teachers are taking part in the Class-Size Project in cooperation with the Bureau of Educational Research:

	Grade	No. of Pupils
Webster School—		
Miss Power	II-B	36
Miss Mueller	II-B	19
Miss Weider	V	39
Miss Atkinson	V-B	20
East Side Central School—		
Miss Hill	II	24
Miss Matthews	II	41
Mrs. Thompson	V	28
Miss Gibson	V	43
Anna Pickett School—		
Miss Waite	VII	16
Miss Harris	VII	36

Under the supervision of Superintendent C. R. Reed, the following teachers in the second, fifth, and seventh grades of Akron are taking part in the Class-Size Project which is being carried on in cooperation with the Bureau of Educational Research:

	Grade	No. of Pupils
Jennings School—		
Mrs. Lieullen	II-B	50
J. A. Fitzpatrick	V-B	43
Fraunfelter School—		
Miss Bartlett	II-B	41
Portage Path School—		
Miss Rylander	V-B	46
Miller School—		
Miss Keeney	V-B	44
Miss Squires	II-B	48
Miss Stall	VII-B	51
Robinson School—		
Miss Pleasants	VII-B	43
Findley School—		
Miss Chalfant	II-B	41
Miss Turnbull	V-B	53
Miss Davies	VII-B	42

Mr. J. G. Hickox, director of research at Warren spent the entire day, December 5 at the Bureau of Educational Research. He is organizing his research program for the coming year. The Warren school system expects to cooperate with the Bureau in the following projects: No. 15, Study of the Department of School Attendance; No. 17, A Study of the Repeater; No. 30, A Study of Children's Interests by Means of the Questions They Ask; and No. 40, Remedial Instruction in Arithmetic; Part B. Increasing the Ability to Comprehend Arithmetic Problems.

Miss Mabel Fernald, director of the Vocational Bureau of Cincinnati, has been cooperating with the Bureau in administering intelligence tests to the pupils who are included in the Class-Size Project.

On the Firing Line

Parma passed a bond issue of $175,000 for additions to present buildings at the election, November 6.

The Hartford centralized school district voted three to one in favor of a three-mill levy.

The Wellsville citizens voted two to one in favor of the campaign for additional school revenues.

Extra levies were voted upon in 13 local school districts of Hamilton county. Ten of these levies carried.

Superintendent Milton S. Cox has sent us the following news from Vinton County: Vinton County established two third-grade rural high schools in 1922. One of these was advanced to a second-grade high school the next year. In 1923 three additional rural high schools were established. Dundas is building a three-room one-story building with a full basement. The three-mill levy for school purposes carried in six out of seven townships in the November elections.

Attorney General Crabbe has ruled that boards of education are not liable for damages due to injury or death of school children caused by negligence of drivers of school busses transporting pupils between their homes and school. He also rules that boards of education, under the present laws, cannot legally carry liability insurance for the protection of pupils. The last legislature enacted such a bill but it was vetoed by Governor Donahey. Attorney General Crabbe's ruling was the opinion to Prosecuting Attorney Kuhn of Holmes County.

There are occasional fires in school buildings. This has been brought forcibly to our attention by the recent fires in Lima. In a ten-day period there were three different fires. On November 10 an explosion and fire occurred in the Horace Mann School which tore a large hole through the front of the main recitation room. It very fortunately happened that there were no pupils in the school at that time.

The East Side Parent-Teacher Association of Galion is giving valuable assistance to Superintendent E. V. Bowers in developing the welfare work of the city. Their work will include the following up of the medical examinations of school children.

The Board of Education at Marietta has asked the Bureau to consult with them on the selection of the site for their new high school. P. R. Stevenson and J. C. Morrison, of the Department of School Administration at Ohio State University, after spending two days in Marietta investigating the possible sites, made a detailed report to the Board.

Some of the topics suggested for programs of Parent-Teacher Associations by the Columbus and Franklin County Associations for January are:

National Thrift Week, January 17–23.
Spend Time and Money Wisely
Financial Training of Our Children
How Shall We Teach Them to Save and Spend?
Children's Allowances
Simplification of Dress

Superintendent J. H. Matthews of Gallia County is making preparations for an oratorical and musical contest for high-school students on December 14. A loving cup will be presented to the school securing the greatest number of points in the contest. The county schools are entering upon a systematic study of art and music. This is being done in both elementary and high schools.

Mentor has a new high school enrolling seventy students. The building with modern equipment cost $150,000. The playground consists of 24 acres.

December 7 was set aside by the Amherst schools for the dedication and inspection of the new high-school building. The morning was devoted to visiting the classes in their regular work. At noon a luncheon was served. A pageant "Light" and a demonstration of gymnasium work were given in the afternoon. In the evening the formal dedication took place.

One of the most interesting features of Education Week at Steubenville was the parents' night session of school at La Belle View school. The attendance of more than five hundred parents attested the interest that the community has in its public school and the welfare of the children. The school had a regular session lasting from 7:00 to 8:15 P. M. Regular class work was conducted during this period in order to give parents an opportunity to become more familiar with the activities of their children.

Superintendent M. M. Berry, of Berea, Ohio, reports that two school issues carried by a good majority in the last election: (1) for an additional levy of three mills by a majority of 80 percent, and (2) to exempt a sinking fund levy of 2¾ mills from the fifteen mill limitation. This went over by a majority of 75 percent.

Superintendent Roland S. Kelsey is spending a part of his time this year in carrying out the following program:

1. All high-school curricula have been revised to meet the new college entrance requirements.
2. Special attention is being given to the teaching of the "three *R's*."
3. Emphasis is placed upon the importance of teaching respect for the flag, thereby insuring respect for law. Flag display is a part of the program of patriotic instruction which is being undertaken in this country.
4. Strict and impartial enforcement of the compulsory attendance laws.
5. Well-planned teachers' meetings as effective supervision agencies.

According to a communication from County Superintendent L. M. Eschbach the new high school at Payne, Paulding County, was dedicated Friday, November 23. This was a memorable day for the children of Payne. Several interesting events took place. A big basket dinner was served in the school building between 11:00 and 1:00 o'clock. There was a parade of school children starting at 1:30 from the different elementary schools and the high school. In the parade were also school wagons which will be used for transporting the pupils. A football game between Payne and Eden took place in the afternoon. Every family in the district was invited to the formal dedication that evening.

The Third Annual Meeting of the Cleveland Educational Research Club was held December 7. The following subjects were discussed: (1) "Getting a Perspective for Vocational Guidance through the Work Permit Office"; (2) "A Two-Years' Follow-up Study, Checking the Results of Intelligence Testing in the Seventh Grade"; (3) "Bluffing—A Problem in Morals"; and (4) "Standards in Education."

The Orange Township building, which cost $235,000, is almost ready for occupancy. The building has a separate auditorium and gymnasium in addition to fourteen classrooms. Both grades and high school are to be accommodated. The site contains ten acres, and lends itself readily to development for school purposes.

This building is the largest and finest consolidated school in the county. It will displace eight of the thirteen one-room schools remaining in the county. Two more will be abandoned when the new Royalton building is completed and two others will probably be disposed of by transfer before the present school year closes, leaving only one one-room school in the county district.

Bonds to the amount of $135,000 have been sold to build a new high-school and grade building in the Cardington School District.

Superintendent E. E. Ray of Morrow County says that two extension school centers are now in operation and that increased professional spirit is the result.

Since the organization of the Bureau of Special Education and Psycho-Educational Clinic at Miami University, several interesting lines of work have been conducted. The primary functions of the Bureau are: (1) to train teachers to take charge of classes for mentally deficient, retarded, delinquent, and speech defective children; (2) to examine the efficient children in schools in the State of Ohio and to make recommendations concerning their classification and education; and (3) to consult with school authorities regarding the classification of children and the organization of special classes. In addition to these three types of activities the different members of the staff are working upon individual research problems.

County Superintendent O. H. Bennett reports that Colerain Township, one of the largest townships of Hamilton county, is constructing a new grade and high-school building which will cost approximately $90,000. This building will be located on a twelve-acre tract of land, and will include classrooms, domestic science and manual training rooms, laboratories, library, and an auditorium that will seat 500 people. The corner stone of this building was laid the latter part of September, and the brick work is now nearing completion. This building when finished will eliminate seven two-room and four one-room schools.

Delphi Township carried a bond issue for $75,000 which is to be used for the construction of a new centralized building. Bonds have been issued and sold to the amount of $60,000. The Board of Education has purchased a ten-acre tract of land near the center of the township. This new Delphi Township school will eliminate two one-room and two two-room schools.

Fairview and Berea passed special levies for school purposes.

The Lakewood school bond issue went over three to one. No special publicity campaign was needed to carry this issue since it has been the policy of the Board of Education to keep up a continuous publicity program. Mr. G. W. Grill, clerk of the Board, reports that "with this sort of continuous publicity we do not feel it necessary to make an unusually great effort in the case of a bond issue. The success of our method is illustrated by results during the past five years. During that time the people of Lakewood have at different elections voted favorably on the following school propositions:

1. School building bonds, $1,125,000.00
2. Three-mill levy outside ten-mill tax limit
3. School building bonds, $600,000.00
4. Exemption of sinking and interest fund levies from tax limits
5. School building bonds, $700,000.00
6. Three-mill levy outside all limits
7. School building bonds, $200,000.00

All rural teachers should know that they may receive books for themselves and for their pupils from the Ohio State Library at Columbus. Any resident of the State may draw books upon signing an application blank. Books may be requested by giving the author or title, or by subject. Any reasonable number of books will be sent and may be kept for four weeks. Postage both ways must be paid by the borrower. The State Library suggests that if there is a local library, it should be tried first. If your librarian does not have the books you want, ask her to borrow them from the State Library.

Traveling libraries will be sent to schools. These libraries vary in size from one to several hundred volumes and may be kept from three to nine months or may be changed as frequently as desired. The delivery charges (express) must be paid by the borrower. Since last June over nine thousand dollars' worth of books have

been purchased for the traveling library. Such an offer as this from the State Library should be accepted by every one-room school in the State. The only cost is the express and that should not be more than three or four dollars. Address all communications to Mr. H. S. Hirshberg, state librarian, Columbus, Ohio.

Some interesting items have been found in the last issue of the *Speedometer*, the official bulletin of Portage County. The following is a good statement of what occurs with the closing of one-room schools, "there has been a passing of untrained teachers, antiquated textbooks, ungraded pupils, common drinking cups, poor equipment, faulty ventilation, uneven heating, and community isolation."

The following note on "Publicity" also occurs in the same paper: "What have you done at your school, or what are you planning to do, that is of interest to the county at large? Many schools had Hallowe'en carnivals, several have had special plays, and most of them had patrons' day, and yet just occasionally one would hear or read of such activities in schools. Each principal or superintendent should appoint a responsible pupil in the school to report all such activities that would be of interest to other schools. This material should be sent to the County Office where it will be copied and sent to the newspapers of the county. Such news items are welcomed by the editors and eagerly watched for by the reading public as each community likes to know what the other people are doing."

Wickliffe has been advanced from second-grade to first-grade high school. LeRoy Heavilin is the superintendent.

Two new consolidated buildings in Lake County are nearing completion, one in Concord Township costing $30,000 and one in South Madison costing $40,000.

The percent of attendance in Wood County in 1914 was 85; in 1922, 93 showing an 8-percent increase in eight years. During this eight-year period the enrollment increased by 943 pupils. Due to consolidation of schools, however, there are 56 fewer teachers today than there were in 1914. The Wood County supervision program for 1923–24 is as follows:

A. Aim of supervision: Improvement of classroom procedure.
   I. By introducing and perfecting some of the newer projects and practices in education.
   II. By re-emphasizing work in fundamental school subjects that should be brought to higher standards.

B. New school subjects in 1923–24:
   I. Physical education.
      1. Aim: Develop and make permanent habits that condition good health.
      2. School activities which are conducive to good health:
         a. Supervised play.
         b. Calisthentics.
         c. Athletics.
         d. Making health posters and booklets by pupils.
         e. Class instruction in hygiene and physiology by teachers, physicians, and nurses.
   II. Supervision and measuring of handwriting by the teacher. (Mimeographed suggestions sent to each school).
   III. School music.
      1. Better appreciation of good music.
      2. More interest in both vocal and instrumental music.
      3. Proper song material and correct tone quality.

C. Topics of last year's supervision program to be re-emphasized.
   I. Objectives in reading.
      1. Oral reading.
      2. Silent reading. (Demonstration lessons will be given to assist in developing habits and attitudes which need emphasizing at different stages of development).
   II. Objectives in arithmetic.
      1. Definite standards for each grade in fundamental facts and operations.
      2. Mastery of reasoning problems. (Mimeographed formal and informal tests are given to help the teacher in checking results).

Dayton is leading the cities of the State in efficient library service. Motor trucks carry library books to the citizens' front doors. The officials at the Dayton Public Library wanted to extend the service and get more books before the public, but they did not have money enough to build new branches so they hit upon the idea of a circulating library in a truck. This truck is equipped with six hundred volumes of selected fiction and carries one hundred and four current magazines. You get your library card from one of the young women who accompany the truck and draw the books you desire. The only charge is the fine for keeping the book too long. The itinerant librarian goes over a different road each day and assistant librarians go over the same road once a week in order that the reading public may become acquainted with them. Miss Electra C. Doran, librarian, says, "It is surprising but true that people who have not been inside a library for years choose good books. Books which make a person think are the ones most in demand."

Brooklyn Township passed a bond issue for $75,000 at the recent election.

Educational Readings

TERRY, PAUL W. AND YOUNG, WESLEY G. *High-school seniors and international good will.* *E*, 44:177-88, November, 1923.

The object of this report is to give a limited cross-section of the attitude of high-school Seniors in a large city on the Pacific Coast toward the Japanese. It is believed that the material is highly suggestive of the attitudes of students in other sections of the country toward the foreign nations with which those sections are most directly concerned. On the basis of approximately 300 high-school Seniors the investigation shows that the Japanese were considered industrious, thrifty, and courteous, but crafty. One-half of the group believed that war with Japan is inevitable, and more than twice as many reasons were given for the inevitability of war as against it. The writers conclude that any movement which aims toward international peace must take account of the attitudes of high-school students toward foreign nations.

NUTTING, H. C. *Taking the measure of Latin.* *CJ*, 19:87-96, November, 1923.

The writer feels that "education in America is drifting from safe and conservative moorings," and presents a considerable amount of argument mixed with satire and sarcasm to prove the conclusions which are stated as follows: (1) no sudden and drastic changes in curriculum should be made on the basis of the apparent result of formal measurements; (2) no teacher should make a change in method on the basis of the supposed results of formal measurement, if these results are at variance with previous actual experience in teaching; and (3) no teacher should make a change in method without knowing clearly the reasons.

DUBLIN, LOUIS I. AND GEBHART, JOHN C. *Do height and weight tables identify undernourished children?* *AJPH*, 13: 920-27, November, 1923.

The article reports the results of an examination of the records of about 4,000 children among the Italians in one district of New York City. The general conclusion is that the use of height and weight tables alone as a guide to the state of nutrition of children is not adequate or sufficiently accurate.

KEYES, ROWENA KEITH. *An experiment in marking first-term compositions.* *JEM*, 3:118-20, November, 1923.

This is a brief, readable account of the method used by the head of a Department of English in attempting to unify the markings of different teachers.

PERRY, ARTHUR C. JR. *The new study of the French elementary schools.* *EA&S*, 9:47-64, November, 1923.

We find here a very brief resumé of the new programs of French elementary schools under the revised regulations of February, 1923. The article will be of especial interest to students of comparative education.

The abbreviations used in this issue are as follows: *E*, Education; *JEM*, Journal of Educational Method; *ER*, Educational Review; *JHE*, Journal of Home Economics; *JEP*, Journal of Educational Psychology; *EA&S*, Educational Administration and Supervision; *ESJ*, Elementary School Journal; *AR*, American Review; *AED*, American Educational Digest; *JAP*, Journal of Applied Psychology; *WVSJ*, West Virginia School Journal; *U*, Ungraded; *MLJ*, Modern Language Journal; *AJPH*, American Journal of Public Health.

VEVERKA, M. MADILENE. *A habit curriculum for the four-year-old or thereabouts. JEM*, 3:121-23, November, 1923.

This is a simple listing of the skills and abilities desirable in children of pre-school age. It presents material which might be used to advantage by kindergartens, parent-teacher organizations, or mothers' clubs.

RICH, STEPHEN G. *Some unnoticed aspects of the school use of phonographs. JEM*, 3:108-14, November, 1923.

The writer presents from his own experience certain facts regarding machines, records, and means for getting better results. No data are presented, but many of the suggestions are eminently worth trying out.

DANIELS, EARL. *English for the amateur many instead of the expert few. ER*, 66:205-11, November, 1923.

The writer, who is an English teacher, after noting that in spite of the time spent in teaching the classics in the high schools, "the graduates appear at college, reading, if masculine, Zane Grey and the *Saturday Evening Post;* if feminine, Harold Bell Wright and the *Ladies Home Journal*," argues strenuously for a change in our English work. His conclusions are that "the following things should outstandingly be kept in mind:

1. The abolition of the teaching of grammar.
2. Composition as an opener of eyes and ears. Consequent upon the opening should come training in the adequate presentation of things seen and heard, to the end that the student may become, in his present and future community, a more vital personality. This demands the reduction of punctuation and other formalisms to a vanishing minimum.
3. Literature that emphasizes the contemporary—a beginning with the present and working back, since after school the student is more likely to follow up an interest in the contemporary. Constantly and almost exclusively is the student's enjoyment here to be held in view."

EIKENBERRY, D. H. *Permanence of high-school learning. JEP*, 14:463-81, November, 1923.

"The purpose of the present study was to determine as accurately as possible the permanence of learning of certain subjects studied in high school but not continued in higher institutions." A study of intelligence scores, high-school marks, and the results from a few subject tests reveal some interesting facts on this problem. Among the results noted are: retention seems to be greatest in American history, and the least in chemistry and physics; there is a positive correlation between intelligence and test scores, and practically no correlation between intelligence and school marks.

STECKELBERG, ANNA L. *Planning for the hot lunch in rural schools. JHE*, 15:642-46, November, 1923.

The article presents in clear-cut fashion some of the difficulties in the way of a hot-lunch program in rural schools. It gives a definite plan which has the advantage of being worked in one community.

WALDO, DWIGHT B. *Should the normal schools become teachers' colleges? ER*, 66:198-200, November, 1923.

Mr. Waldo presents fourteen factors which indicate an affirmative answer to that question. This brief will be of especial interest to those interested in teacher training.

ZELENY, LESLIE D. *Some fundamental considerations underlying the development of morale in the high school. EA&S*, 9:487-97, November, 1923.

This article is highly suggestive and is accompanied by a select bibliography. The statements are mostly dogmatic, but will appeal to the reader as reasonable.

SANGREN, PAUL V. *The Woody-McCall mixed fundamentals test and arithmetical diagnosis. ESJ*, 24:206-15, November, 1923.

This is a report of a study of the errors made by pupils in grades III to VIII. The errors both in percentage and total number were classified by operation involved and the grade in which the errors were made. Among the conclusions reached are: About three-fourths of all errors made in the fundamental operations on this test are due to (1) incorrect carrying or failure to carry, incorrect borrowing or failure to borrow, incorrect reduction or failure to reduce, incorrect placing of decimal or omission of decimal, incorrect inverting or failure to invert, and insufficient knowledge of the multiplication and combination tables; (2) the most typical wrong answers are those due to the use of wrong processes; (3) the diagnostic value of this test may not be so great as would otherwise appear since many of the wrong answers were undoubtedly due to the construction of the tests.

PARK, FORD R. *A grading and promotion plan based on the use of intelligence and educational tests. ESJ*, 24:219-26, November, 1923.

The article presents with acceptable clearness the plan which the writer has in

operation in his own school and may contain suggestions for those who are facing similar problems.

COLVIN, STEPHEN S. *Native intelligence, growth, and opportunity. AR*, 1:650-56, November-December, 1923.

In this article the author defines clearly what he means by innate intelligence, and traces the significance of the change in mentality with constancy of the I. Q. Among the significant statements we read: "All three factors must be present in order that actual intelligence may be achieved, namely, native capacity to become intelligent, the normal development of this capacity and an environment favorable to learning." He shows that in the presence of these factors, innate mentality develops with increasing years up to maturity and then suffers progressive deterioration with advancing years.

Improving high-school assemblies. AED, 43:51-53, 82-83, October, 1923.

This is a report from an extensive questionnaire on high-school assembly programs with the addition of quotations from a large number of superintendents and principals. It is significant that the majority of those voting reported that addresses by outsiders were most profitable. Student activity programs, class plays, and school singing follow in order. The constructive suggestions included: careful, definite planning of each detail; faculty interest; less faculty domination of assemblies; and student participation. Assemblies should be held only when worth-while programs are fully prepared. They should run on time as scheduled.

KNIGHT, F. B. AND REMMERS, H. H. *Fluctuations in mental production when motivation is the main variable. JAP*, 7:209-23, September, 1923.

Teachers are well aware of the fact that many students do not work up to their capacity. The authors' data on two investigations of capacity effort and mental fatigue bring out certain facts which may well be translated into classroom usage. A two-hour period of the kind of material presented was not found to be sufficient to decrease the output of students who were already physically tired. The difference between genuine motivation and ordinary classroom motivation was a difference which not only offset extreme fatigue, but offset difference in ability between freshmen and junior groups and produced much more work of equal quality.

WARNER, M. LAVINIA. *Influence of mental level in the formation of boys' gangs. JAP*, 7:224-36, September, 1923.

This is largely a case study dealing with a small group of boys, but throws some definite light on the question which is so often raised in regard to grouping children on the mental-age basis. From the evidence mental age seems to be a large factor in determining the boys' choice of companions.

FARRAR, JOHN. *What will American children read? WVSJ*, 52:188-89, November, 1923.

This is a report on the results of a series of prizes offered by the *Bookman* to children for the best essays on "The books I like to read." Two hundred ninety-eight papers were submitted and lists of popular books and authors have been arranged therefrom. *Little Women*, *Treasure Island*, *Huckleberry Finn*, *Tom Sawyer*, and *Pollyanna* occupy the first five places; Louisa Alcott, Mark Twain, R. L. Stevenson, Charles Dickens, and Gene Stratton Porter have corresponding places for authors. Mr. Farrar states that he is far more optimistic about children's readings since making this survey than before although he is not proud of the fact that five percent of the children stated that they "adored the Tarzan books."

TOOPS, HERBERT A. *Some fancies and facts about human abilities and their significance for trade education. U*, 9:1-9, 29-34, October and November, 1923.

The writer investigates some of the common beliefs about human abilities such as the tradition that the slow worker is accurate, and vice versa; that intelligence and mechanical ability exist in negative correlation; and that women are generally lacking in mechanical ability. He also raises and answers the question regarding the use of intelligence and mechanical tests in grouping pupils in classes. The truths about these questions as revealed by experimental evidence are given in simple, readable form.

FEINGOLD, GUSTAVE A. *Views of teachers on the sectioning of high-school classes on the basis of intelligence. EA&S*, 9:467-86, November, 1923.

This is a report of 33 teachers in the Hartford, Connecticut, high schools as to the advisability of sectioning classes on the basis of intelligence. All were teachers of lower freshmen subjects, and had been handling classes so sectioned for one semester. Each of the half-dozen questions asked on this subject was answered by all teachers. Their individual comments are presented with tabulated summaries for the teachers of the different subjects. The final conclusions show that such sectioning is highly desirable, but that there are

certain administrative factors which need intelligent handling. The frank replies should be of assistance to superintendents or principals who are organizing their classes on this basis.

HILLS, E. C. *The students' point of view.* *MLJ*, 8:73-83, November, 1923.

The writer gives us extracts from brief papers which students presented in response to a request for a brief account of the sort of instruction in modern languages which they had received, and the reforms which they would like to see made. In general, the comments indicate that the students would like to have better trained teachers and smaller classes in elementary courses; that they desire more "atmosphere" even if it consists merely of maps and photographs; and that students resent the loss of time and misdirection of energy which result from the activities of certain teachers. The article should be of interest not only to modern language teachers, but to teachers of other subjects as well.

Books to Read

HORN, J. L. *The American Elementary School.* New York, The Century Company, 1923. 422 pp.

After an introduction, which is a summary of the field of the elementary school, the author presents in successive chapters various problems relating to the external relations of the school, its organization, and the problems of instruction.

Although this book contains little that is new it will serve as an excellent textbook.

THORNDIKE, EDWARD L. and others. *The Psychology of Algebra.* New York, The Macmillan Company, 1923. 483 pp.

Of this book one reviewer says, "The classroom teacher of high-school mathematics is certain to profit by reading the discussion of the abilities most worth acquiring in a year's course in algebra, irrespective of his complete agreement with the topics listed. The detailed suggestions concerning particular items of learning to be added or omitted, and the discussion of the learning of meanings and procedures are sure to be significant in helping to bring about desirable changes in classroom teaching."

REYNOLDS, ROLLO. *Newspaper Publicity for Public Schools.* New York, A. G. Seiler, 1922. 120 pp.

Many superintendents are interested in the forms of school publicity which have been used successfully by others and which may serve as suggestions in their work. This monograph instead of discussing publicity for special campaigns emphasizes continuous news service. This investigation includes: (1) the study of the amount and character of school news found in daily papers; (2) school news from the viewpoints of the editor, the superintendent, and the reader; and (3) a program for the school informational service in the daily paper.

KELLEY, TRUMAN L. *Statistical Method.* New York, The Macmillan Company, 1923. 390 pp.

According to the Preface the author has consciously attempted to meet (1) the needs of "biologists, economists, educators, and psychologists, who know little mathematics, possibly care less, and who use statistical methods merely as a device to portray the facts of their group investigations; and (2) the needs of those in the same fields who resort to mathematics to aid in the discovery of new truths." The various concepts of statistical method are discussed and the derivation and proof of all formulae are furnished. This book, written by a foremost statistician, is a contribution to the field.

SYMONDS, PERCIVAL MALLON. *Special Disability in Algebra.* New York, Teachers College, Columbia University, 1923. 188 pp. (Teachers College, Columbia University. Contributions to Education, No. 132).

Two methods of approach were employed in this investigation, (1) the study of individual cases and (2) the calculation and use of certain derivations from correlations properly corrected, to measure the amount of disability. Special disabilities which were measurable were found in 20 out of 122 cases studied.

Toward the close of the book the author gives practical suggestions on the course of study, textbooks, class assignments, and class periods.

In Paper Covers

PHILLIPS, G. E. *The standardization of tests of general ability for Australian children.* Sidney, Australia: W. A. Pepperday and Company, Ltd., 1923. 36 pp. (Studies in Experimental Education, No. 1).

The author here presents the results of an extensive testing program with opposites. The difficulty of 120 words for children in grades III to VI, inclusive, was standardized by use of P. E. method. The words were by this method arranged in three tests of approximately equal difficulty. The easiest words were *up* (difficulty, 2.1), *good* (difficulty, 2.2) and *yes* (difficulty, 2.3). The hardest words were *boastful* (difficulty, 8.2), and *courage* (difficulty, 8.2).

New Tests

The Inglis Latin Tests, published by the Harvard University Press, include tests in general vocabulary, syntax, and morphology. A manual has been prepared for each form of the test which gives, in addition to directions for giving and scoring, some description of the method used in devising the test. Five forms of each test have been prepared.

The Third-Grade Attainment Scale, devised by Doctor Luella W. Pressey, includes within a four-page folder a test in spelling, arithmetic, and reading. In her directions the author states that the test should not take more than 30 minutes. Time limits are set for the tests in arithmetic and reading, and the norms for III-B and III-A are given. This test is published by the Public School Publishing Company.

The city of Detroit is using a series of reading tests devised by a number of teachers working under the guidance of Miss Claudia M. Parker of the reading department. These tests are designed for use in grades II-A to IX-A, inclusive. Each test consists of 12 paragraphs upon which two questions are asked. One question is purely factual and the other is interpretative. In all cases the multiple-choice type of response is presented, and the child needs only to underscore the correct word. The test is a time test, and the scoring is in terms of the number of questions attempted and the percent of accuracy.

The J. B. Lippincott Company announces the publication of a new speed of reading test, *Lippincott's Continuous Passage Reading Test* by Chapman and Cook. The test consists of thirty paragraphs in each of which there is one word that spoils the meaning. The task of the child is to read the material as rapidly as possible, find this irrelevant word, and cross it out. The tests are designed for grades four to eight, inclusive, and norms have been determined not only in terms of the median but in four gradations in each direction from this median.

The Commonwealth Fund has appropriated a sum for support of the study of history textbooks. The particular texts to which consideration will be given are those which are written for use in the sixth grade, and which have an "Old World" background. Doctor Raymond Franzen, of the University of California, will be in charge of the project. The texts which he will examine will be evaluated primarily in terms of the criteria of interest, comprehension, and permanent value of subject matter.

We have received from D. H. Rinsland, Department of Research and Guidance, Ardmore, Oklahoma, a copy of an individual test record card which he is using. The card provides, besides the name, age, and grade location of the child, a space for recording scores for three tests in reading, two in arithmetic, one each in nature study and science, history and literature, language and dictation. The scores are to be translated into educational age, mental age, intelligence quotient, educational achievement, educational ratio, and promotion achievement ratio. There is a place to indicate the group assignment of the child into X, A, B, C, and Y classes, X indicating a very retarded group segregated for special work, and Y, a very bright group at the upper range of the distribution.

The children of Vinton County are going to have books to read. The library fund, in a large majority of the schools, is being aided by the proceeds from pie suppers and bake sales.